

OPPORTUNITY

Why is GSA interested in alternative water treatments?

6%

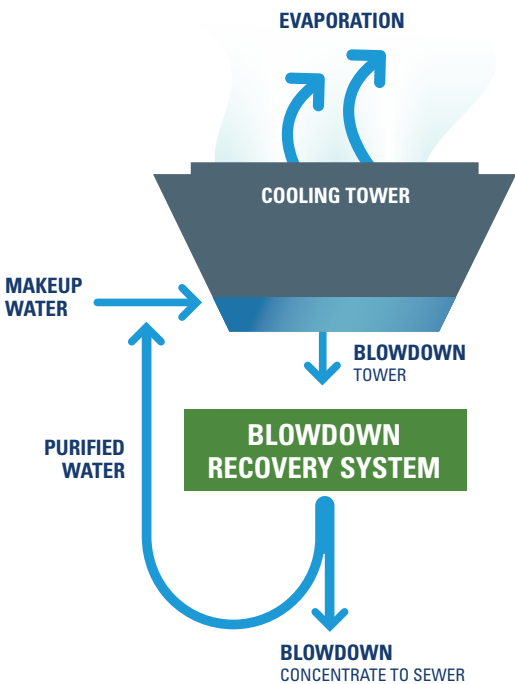
ANNUAL INCREASE IN GSA WATER RATES
In the past 10 years, water rates have increased more than 40%. Water is the fastest growing utility rate for GSA.

TECHNOLOGY

How does the blowdown recovery system work?

**RECOVERS
BLOWDOWN
AND PURIFIES
IT FOR REUSE**

Incorporates sidestream filtration, demineralization, carbon filtration, reverse osmosis, and a control system



M&V

Where did Measurement and Verification occur?

NATIONAL RENEWABLE ENERGY LABORATORY (NREL) assessed a blowdown recovery system provided by Aqualogix in three cooling towers at the Lloyd D. George Courthouse in Las Vegas, Nevada

RESULTS

How did the blowdown recovery system perform in M&V?

**53%
BLOWDOWN
SAVINGS**
16% makeup water savings¹

**O&M
UNCHANGED**
Works alongside traditional chemical treatment²

**MET
GSA WATER
STANDARDS**
Monitors performance and sends alarms³

**3
YEAR
PAYBACK**
@ \$16.76/kgal⁴

Blowdown Recovery Return on Investment

@ 3-million ton target load and GSA 2017 average water cost of \$16.76/kgal

	Blowdown Recovery System
Equipment (200-1000 ton load)*	\$35,403
Installation**	\$11,422
Annual Maintenance***	\$475
Annual Energy Increase (3,541 kWh/yr @\$0.11/kWh)	\$390
Water Savings (1,040,400 kgal @\$16.76 kgal/yr)	\$17,437
GSA Average Payback (yrs)****	2.86
GSA Average Savings-to-Investment Ratio	5.3

* Includes startup; assumes \$688 shipping and \$1,473 for training
** Assumes no tie-in with Building Automation System
*** Includes \$350 annual support, membranes replaced every 5 years (\$125 per membrane).
**** Payback assumes target load of 3-million ton hours. Testbed payback was 4.8 years with 1.6 million ton hour load @ \$18.97 kgal

DEPLOYMENT

Where does M&V recommend deploying the blowdown recovery system?

CONSIDER FOR ALL COOLING TOWERS

Continues standard and familiar water treatment practices and may offer an easier and more failsafe deployment opportunity for GSA facilities.

¹Blowdown Recovery System for Cooling Tower Water Treatment, David Sickinger (NREL) July 2023, p. 3 ²Ibid, p.2 ³Ibid, p.3 ⁴Ibid, p.3